

# SMS printers aid early infant diagnosis of HIV/AIDS in Nigeria

## CHAI's SMART



Half of all infants born with HIV will die before they reach two years of age if left untreated. Early infant diagnosis and immediate treatment with antiretroviral therapy (ART) are critical (1). Despite a dramatic, eight-fold increase in early infant diagnosis across sub-Saharan Africa since 2006, the 2009 *Children and AIDS: fourth stocktaking report* showed that almost 50% of infants tested for HIV never receive their test results (2). Early infant diagnosis of HIV requires a sophisticated virological test (PCR)<sup>1</sup> that can only be performed at a handful of laboratories in Nigeria, creating challenges for communicating the results back to the health facilities and thus delays in providing timely treatment.

To address these challenges, the Clinton Health Access Initiative (CHAI) partnered with two engineering companies to develop a new technology – SMS printers – that can strengthen early infant diagnosis services by reducing the turnaround time for test results by more than half.

### How SMART works

SMART stands for 'SMS Printers to Accelerate Return of Test Results for Early Infant Diagnosis of HIV/AIDS'. The SMART programme addresses a critical barrier to early infant diagnosis (EID) by leveraging simple mobile technology and design to more rapidly communicate HIV test results from the laboratories back to the health facilities. Nearly every district in Nigeria has network coverage for mobile telecommunications, even in remote areas lacking roads and electricity. Using mobile SMS technology and small, battery-operated printers, health facilities can receive and print EID test results without having computers and Internet access and without waiting for a hard copy to be delivered. Operation of the SMS printers can easily be taught to unskilled health workers in very remote areas. These devices require limited maintenance and only thermal paper as a consumable. The ability to instantly transfer results from the lab to the health facility via SMS has been demonstrated to reduce turnaround time significantly, thereby helping caregivers and clinicians to promptly initiate life-saving ART and resulting in fewer infants being lost to follow-up (3).

### Supporting national public health programming

In Nigeria, there are an estimated 230 000 HIV-positive pregnant women who are at risk of infecting their babies in the absence of adequate care. The Government of Nigeria, in collaboration with a range of partners, is coordinating an aggressive response by scaling up prevention of maternal-to-child transmission (PMTCT) programmes. In partnership with the Federal Ministry of Health, CHAI is expanding the SMART programme to keep pace with the rapid expansion of early infant diagnosis in Nigeria, which has grown from 745 tests in 2007 to over 38 000 in 2011. The SMART programme addresses one of the primary objectives of the national PMTCT scale-up plan (2010–2015): to ensure that at least 90% of all HIV-exposed infants have access to early infant diagnosis services (4). Beyond enabling progress towards this target, the SMART technology also provides aggregated data across all sites where SMART has been implemented; this will allow the Government to track PMTCT performance indicators nationally once the programme has been scaled up.



<sup>1</sup> PCR = polymerase chain reaction



Early infant diagnosis of HIV is critical



Infant tested, sample sent to lab



Lab test for HIV and results instantly returned to remote health facility by SMS technology



Results received and printed by SMS printer, and shared with baby's caregiver



Life-saving treatment promptly initiated

## Partnerships for support and sustainability

To ensure that the SMART programme continues to achieve real, sustained progress towards improved early infant diagnosis and treatment of HIV, CHAI is building on support from a number of partners and working to fully integrate the programme into local and national management structures. CHAI's primary partner, the Government of Nigeria, has included the procurement of 70 additional printers in the 2013 budget for the HIV/AIDS Division of the Federal Ministry of Health, to support scale-up of the SMART programme. CHAI works closely with the Federal Ministry of Health, the PCR lab units and the Implementing Partners from both PEPFAR (the President's Emergency Plan For AIDS Relief) and the Global Fund to Fight AIDS, Tuberculosis and Malaria to develop management and technical expertise, both locally and nationally. In addition, the Hewlett-Packard Company is working with local universities to provide a centralized computing infrastructure as well as software applications for labs to enable real-time management and monitoring of programme data.

## IWG catalytic grant for mHealth programme scale-up

CHAI was awarded a grant to scale up the SMART programme in Nigeria by the United Nations Innovation Working Group's (IWG's) catalytic grant competition for maternal, newborn and child mobile health (mHealth), managed by the mHealth Alliance. SMART was successful in the grant competition because it employs an effective delivery strategy for an evidence-based child health intervention, combined with creative financing strategies to promote sustainability – elements that are critical for mHealth tools to contribute to Millennium Development Goals 4 and 5.<sup>2</sup> Through IWG, CHAI Nigeria is receiving assistance from WHO RHR to optimize scale-up of the SMART programme while contributing to the mHealth evidence base and best practices on implementation and scale-up.

<sup>2</sup> MDG 4 is to reduce child mortality; MDG 5 is to improve maternal health ([www.unmillenniumproject.org/goals/gti.htm](http://www.unmillenniumproject.org/goals/gti.htm))

### References:

1. Newell ML et al. Mortality of infected and uninfected infants born to HIV-infected mothers in Africa: a pooled analysis. *The Lancet*, 2004, 364:1236–1243.
2. *Children and AIDS: fourth stocktaking report, 2009*. UNICEF, UNAIDS, WHO, UNFPA, 2009 ([www.unicef.org/publications/files/Children\\_and\\_AIDS\\_Fourth\\_Stocktaking\\_Report\\_EN\\_110609.pdf](http://www.unicef.org/publications/files/Children_and_AIDS_Fourth_Stocktaking_Report_EN_110609.pdf)).
3. *Early infant diagnosis*. Interagency Task Team (IATT) on the Prevention and Treatment of HIV Infection in Pregnant Women, Mothers and Children, IATT Laboratory & Child Survival Working Group, 2012 ([www.emtct-iatt.org/wp-content/uploads/2012/12/EID-GSG.pdf](http://www.emtct-iatt.org/wp-content/uploads/2012/12/EID-GSG.pdf)).
4. Federal Ministry of Health of Nigeria. *National scale-up plan towards elimination of mother-to-child transmission of HIV in Nigeria 2010–2015*. Government of Nigeria, 2011.

### Credits:

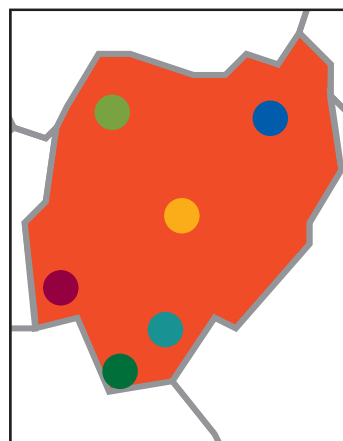
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## Nigeria

- 🖨️ Number of facilities with SMS printers
- 👤 Number of health-care workers trained
- 🖨️🚫 Number of facilities (pending roll-out)

All numbers are those reached by November 2012.

### North-Western

Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto and Zamfara

🖨️ 14   👤 42   🖨️🚫 23

### North-Central

Benue, Kogi, Kwara, Nasarawa, Niger, Plateau and Federal Capital Territory, Abuja

🖨️ 34   👤 102   🖨️🚫 6

### North-Eastern

Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe

🖨️ 24   👤 72   🖨️🚫 10

### South-Western

Ekiti, Lagos, Ogun, Ondo, Osun and Oyo

🖨️ 27   👤 81   🖨️🚫 12

### South-South

Akwa Ibom, Bayelsa, Cross River, Delta, Edo and Rivers

🖨️ 31   👤 93   🖨️🚫 5

### South-Eastern

Abia, Anambra, Ebonyi, Enugu and Imo

🖨️ 26   👤 78   🖨️🚫 18

**Assistance:** The project receives a grant from the mHealth Alliance; and specialized research assistance from WHO's Department of Reproductive Health and Research.

**Partners:** Federal Ministry of Health of Nigeria, HIV/AIDS Division; Hewlett-Packard Company; Institute of Human Virology, Nigeria; PEPFAR Implementing Partners; Global Fund Implementing Partners

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